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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,747	08/14/2003	Daniel Joseph Christian Herr	361007-000025	1746

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EXAMINER
WILCZEWSKI, MARY A

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/604,747	HERR ET AL.	
	Examiner	Art Unit	
	M. Wilczewski	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *32-38* is/are withdrawn from consideration.

5)☒ Claim(s) *17-31* is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the election submitted on December 22, 2004.

Drawings

The drawings filed August 14, 2003, are acceptable.

Election/Restrictions

Applicant's election without traverse of the invention of Group II, claims 1-31, in the reply filed on July 12, 2004 is acknowledged. A complete reply to this final rejection should include cancellation of non-elected claims 32-38 or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 102 / 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12, 14, and 15 are rejected under 35 U.S.C. 102(a, e) as anticipated by, or in the alternative, under 35 U.S.C. 103 as obvious over Yamazaki, U.S. Patent 6,617,647, of record.

Yamazaki discloses a semiconductor field effect device which has an SOI structure which comprises a host structure 701 comprising a channel region and an engineered array 707 of at least one impurity at the channel region of the host structure such that component atoms of the engineered array 707 are substantially fixed by substantially controlled placement in order to provide substantial control of carrier flow, see figures 7A-7E and figures 12A-12C.

The claims have been amended to require that ***a position of each component atom*** of the engineered array is ***substantially*** fixed by ***substantially*** controlled placement in order to provide ***substantial*** control of carrier flow. Applicant has argued that the device of Yamazaki has specifically placed regions of impurities and that Yamazaki does not control the position of individual atoms in each impurity region. Admittedly, conventional ion implantation has been described in the prior art as a method in which ions are shot into a substrate "in much the same way that a shotgun sends pellets into a target." (See Nanomechanical memory cell could catapult efforts to improve data storage, Nanotechnology Now, September 30, 2004, cited on the PTO-

892, attached hereto.) However, the claims as presently written only require that the positions of the atoms be ***substantially*** fixed by ***substantially*** controlled placement of the atoms. Whereas the term substantially has been held to be definite, (In re Mattison, 509 F.2d 563, 184 USPQ 484 (CCPA 1975); Andrew Corp. v. Gabriel Electronics, 847 F.2d 819, 6 USPQ2d 2010 (Fed. Cir. 1988)), the term "substantially" is a broad term. In re Nehrenberg, 280 F.2d 161, 126 USPQ 383 (CCPA 1960). Since Applicant's specication does not provide any guidance for determining what is meant by ***substantially*** fixed or s***ubstantially*** controlled, these terms have been given the broadest possible reasonable interpretation. Since the device of Yamazaki is fabricated by using a mask formed by either electron drawing or FIB; see, for example, column 6, lines 40-50, or column 11, lines 7-20; the positions of the individual atoms (ions) within the implanted regions are deemed to be ***substantially controlled*** by the use of a mask during the implantation step. Moreover, from the disclosure of Yamazaki, it appears that the positions of the individual atoms (ions) in the implanted regions are ***substantially fixed***, see column 13, lines 1+, and that there is little or no outdiffusion due to the very low annealing temperatures used in his method. Hence, due to the broad claim language used, the ion implantation step of Yamazaki is deemed to result in implanted regions in which the positions of the atoms are ***substantially*** fixed by ***substantially*** controlled placement of the atoms. In addition, note from figures 16A-16C that the device of Yamazaki allows ***substantial*** control of carrier flow in the channel region. It is further noted that ion implantation is one technique disclosed by Applicants for placing atoms, see paragraph [0065] of the specification. Deleting the

terms ***substantially*** prior to "fixed" and "controlled" would patentably distinguish the claimed device from that of Yamazaki.

Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Oda et al., U.S. Patent 6,380,036.

Yamazaki is applied as above. Yamazaki lacks anticipation only of the component atoms comprising p-type and n-type dopants. Oda et al. disclose a field effect transistor comprising a channel having both n-type and p-type impurities, see Fig. 13 and col. 10, ll.50-62. Oda teaches that a buried channel prevents punch through at deep positions in the host structure, thus improving punch-through voltage. In light of the teachings of Oda, it would have been obvious to one skilled in the art that the channel region of the transistor of Yamazaki could be formed using both n-and p-type dopants.

Response to Arguments

Applicant's arguments filed December 22, 2004, have been fully considered but they are not persuasive. Applicant's arguments have been addressed above in the rejection of the claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Wilczewski whose telephone number is (571) 272-1849. The examiner can normally be reached on Monday and Thursday.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary Wilczewski
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